**भारतीय मानक**
***Indian Standard***

**IS 7959 : 2023**

# फोम यौगिकों के लिए पॉलीइथाइलीन कंटेनर — विशिष्टि

*( दूसरा पुनरीक्षण )*

# Polyethylene Containers for Foam Compounds — Specification

*( Second Revision )*

ICS 83.080; 83.140

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Plastics Packaging Sectional Committee, PCD 21

## FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Plastics Packaging Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

This standard was originally published in 1976 and subsequently revised in 1987. This standard was originally covering 20 litre HDPE jerry cans only but later extended to higher capacity of 50 litres, 80 litres, 100 litres and 200 litres in its first revision.

In this revision, the following changes have been incorporated:

a) Requirement of use of material of the container have been modified;
b) Cross referred standard have been updated; and
c) Editorial corrections have been made.

A scheme of labelling environment friendly products with the ECO logo has been introduced at the instance of the Ministry of Environment, Forests & Climate Change (MoEF and CC), Government of India. The ECO-Mark is being administered by the Bureau of Indian Standards (BIS) under the *Bureau of Indian Standard Act*, 2016 as per the resolutions No. 71 dated 21 February 1991 and No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with the ECO logo, it shall also carry the ISI Mark of the Bureau of Indian Standards besides meeting additional environment friendly requirements. For this purpose, the Standard Mark would be a single mark being a combination of the ISI Mark and the ECO logo.

The composition of the Committee responsible for the formulation of this standard is given in Annex G.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

# POLYETHYLENE CONTAINERS FOR FOAM COMPOUNDS — SPECIFICATION

*( Second Revision )*

## 1 SCOPE

This standard prescribes the requirements for polyethylene containers intended for packing foam compounds covered in IS 4989.

## 2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revisions, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

## 3 TERMINOLOGY

For the purpose of this standard, the terms covered under **3** of IS 7408 (Part 2) shall apply.

## 4 MATERIAL

### 4.1 Container

The container shall be manufactured from the polyethylene (PE) material conforming to IS 7328.

### 4.2 Cap

The cap shall be made from injection moulding or extrusion grade HDPE.

### 4.3 Inner Plug

The inner plug where provided shall be made from moulding grade LDPE or HDPE.

## 5 SHAPE

The container shall be rectangular or cylindrical in shape and shall be stackable vertically without any external support.

## 6 CAPACITY

The nominal capacities of the containers shall be 20 litres, 30 litres, 50 litres, 80 litres, 100 litres and 200 litres. The minimum brimful capacity of the container shall be not less than its nominal capacity plus 5 percent.

## 7 MASS

Recommended mass of the container with cap and insert is as under:

| *Sl No.*<br>(1) | *Capacity* in litres<br>(2) | *Mass* in kg, *Min*<br>(3) |
|---|---|---|
| i) | 20 | 1.2 |
| ii) | 30 | 1.75 |
| iii) | 50 | 2.75 |
| iv) | 80 | 4.5 |
| v) | 100 | 5.0 |
| vi) | 200 | 9.0 |

## 8 FILLING ORIFICE

The containers up to and including 80 litre capacity shall be provided with one principle orifice of minimum internal diameter of 45 mm. The containers of 100 litre and 200 litre capacities shall be provided with one small orifice of 20 mm minimum diameter as vent mouth besides the principle orifice. Each orifice shall be closed with an insert fitting snugly into it and a screw cap, screwed tight on it to provide a leak-proof closure.

## 9 HANDLE

The container shall be provided with suitable handle(s) or grips. The design of handles or grips shall be such that it provides a balance while lifting the filled container and shall not interfere with the stacking of the containers.

## 10 CONSTRUCTION

The containers shall be of one-piece construction. The handle(s) shall be moulded as integral parts for container up to 50 litre capacity. Containers of higher capacities may be provided with two or more handles or grips fixed symmetrically but may or may not be moulded integrally with the container.

## 11 TEST

### 11.1 Routine Tests

**11.1.1** *Closure Leakage Test*

When tested as per method given in Annex B, there shall be no evidence of leakage.

**11.1.2** *Hydrostatic Pressure Test*

When tested as per method given in Annex C, the containers shall not show any sign of leakage or rupture.

**11.1.3** *Drop Test*

When tested at ambient temperature by the method given in Annex D, the containers shall not rupture or show any leakage.

### 11.2 Type Tests

**11.2.1** *Handle Strength Test*

The container filled with water at ambient temperature to its nominal capacity, when suspended free from its handle(s)/grips for one hour shall not break or show any sign or damage to the container.

**11.2.2** *Stack Load Test*

The containers when tested by the method given in Annex E, shall show no leakage from the container nor any deformation so as to cause instability in stacking.

## 12 ADDITIONAL REQUIREMENTS FOR ECO-MARK

### 12.1 General Requirements

**12.1.1** The product shall conform to the requirements for quality, safety and performance prescribed in the standard.

**12.1.2** The manufacturer shall produce to BIS the consent clearance as per the provisions of *Water (Prevention & Control of Pollution) Act*, 1974 and *Air (Prevention & Control of Pollution) Act*, 1981 along with the authorization, if required under *Environment (Protection) Act, 1986* and the rules made thereunder while applying for the ECO-Mark. The manufacturers of plastic wares shall produce documentary evidence with respect to the compliance of regulation under *Drugs and Cosmetic Act*, 1940 and the rules made thereunder, wherever necessary.

**12.1.3** The product must display a list of critical ingredients in descending order of quantity present expressed as percent of the total. The list of such ingredients shall be identified by Bureau of Indian Standards.

**12.1.4** The product packaging shall display in brief the criteria based on which the product has been labelled as ‘environment friendly’.

**12.1.5** The material used for product packaging shall be recyclable or biodegradable.

**12.1.6** It shall also suitably mention that ECO-Mark label is applicable only to the packaging material/package, if content is not separately covered under ECO-Mark. It may be stated that ECO-Mark is applicable to the product or packaging material or both.

### 12.2 Product Specific Requirements

The plastic products shall apart from fillers and reinforcing agents, be made from the minimum of 90 percent, by weight of compatible plastic wastes.

NOTE — The manufacturer shall provide documentary evidence by way of certificate or declaration to this effect.

## 13 SAMPLING

The samples of the containers shall be drawn and the criteria for conformity shall be determined as prescribed in Annex F.

## 14 MARKING

**14.1** Each container shall be marked with the following information:

a) Name and trademark of the manufacturer, if any;
b) Nominal capacity of the container; and
c) Any other statutory requirements.

### 14.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

# ANNEX A

(*Clause 2*)

## LIST OF REFERRED STANDARDS

| *IS No.* | *Title* |
|---|---|
| IS 2798 : 1998 | Methods of test for plastics containers (*first revision*) |
| IS 4905 : 2015/ ISO 24153 : 2009 | Random sampling and randomization procedures (*first revision*) |
| IS 4989 : 2018 | Foam concentrate for producing mechanical foam for fire fighting — Specification (*fourth revision*) |
| IS 7328 : 2020 | Specification for polyethylene material for moulding and extrusion (*third revision*) |
| IS 7408 (Part 2) : 2000 | Blow moulded polyolefin containers — Specification: Part 2 Over 5 litres, up to and including 60 litres capacity (*first revision*) |

To access Indian Standards click on the link below:

https://www.services.bis.gov.in/php/BIS_2.0/bisconnect/knowyourstandards/Indian_standards/isdetails/

# ANNEX B

(*Clause* 11.1.1)

# METHOD OF TEST FOR CLOSURE LEAKAGE

## B-l PROCEDURE

**B-l.1** The container shall be filled to its nominal capacity with water at ambient temperature and then closed tightly with the insert and outer cap.

**B-1.2** The container shall then be allowed to stand with its upside down with closure at the lowest point without any external support at the closure for one hour and examined for leakage through or around the closure.

# ANNEX C

(*Clause* 11.1.2)

# METHOD OF TEST FOR HYDROSTATIC PRESSURE TEST

## C-l APPARATUS

**C-1.1** A water supply at ambient temperature connected to a tapered rubber plug which will seal the mouth of the container. A suitably modified screw cap may be used instead of the rubber plug.

**C-1.2** A means of regulating the water pressure and a pressure gauge of range 0 kPa to 150 kPa and of accuracy ± 2 percent.

## C-2 PROCEDURE

**C-2.1** The container shall be filled with water to exclude all air and then connected to the water supply. The pressure shall be increased to 100 kPa (1 kg/cm$^2$) and held for a period of 5 min.

**C-2.2** Any leakage from the container other than from around the mouth, or localized bulging of the container shall be deemed to indicate failure to meet the test requirements.

# ANNEX D

(*Clause* 11.1.3)

# METHOD OF TEST FOR DROP TEST

## D-l TEST CONTAINERS

Three containers shall be used for each test. In case of containers with handles projecting outside, an extra container shall be taken for drop directly on to the handles.

## D-2 PROCEDURE

**D-2.1** All the containers shall be filled to their nominal capacity with water at ambient temperature. Each container shall be closed with the inner plug and the cap screwed tight and prepared as for transport.

**D-2.2** Each container shall be subjected to one drop on a rigid, level dropping surface that absorbs negligible energy from a height of l.2 m measured from the lowest point of the container.

**D-2.3** An untested container shall be used for each drop, and the point of impact shall be as follows:

a) Drop the first container flat on the bottom side;
b) Drop the second container flat on the top side directly on to the closure;
c) Drop the third container on the side; in case of rectangular containers drop on the narrower side; and
d) In case of projecting handles, drop the fourth container directly on each handle.

# ANNEX E

(*Clause* 11.2.2)

## METHOD FOR STACK LOAD TEST

### E-l PROCEDURE

**E-1.1** Containers shall be filled with water to its nominal capacity at ambient temperature and closed tight as in usual manner. The containers shall be stacked on a horizontal plane surface without any outside support to a height as given below or otherwise a single container may be subjected to a vertical top load equivalent to the stacking load of container about it:

a) Stack 4 high in case of 20 litre and 30 litre containers;

b) Stack 3 high in case of 50 litre and 80 litre containers; and

c) Stack 2 high in case of 100 litre and 200 litre containers.

**E-1.2** The stacking period shall be 21 days.

**E-1.3** The bottom most container shall be examined for any leakage, bulging or deformation at the end of 21 days after removing the stack load. Any leakage or permanent deformation likely to reduce its strength or cause instability in stacking shall indicate failure of the container in this test.

# ANNEX F

(*Clause* 13)

## SAMPLING OF CONTAINERS FOR FOAM COMPOUND

### F-l SCALE OF SAMPLING

**F-l.1 Lot**

In any consignment all the containers of the same material and drawn from a single batch of manufacture shall be grouped together to constitute a lot.

**F-l.2** For ascertaining the conformity to the requirements of this specification, tests shall be carried out separately for each lot. The number of containers to be sampled from a lot for ascertaining conformity to the requirements of this specification shall be in accordance with Table 1.

**F-l.3** The containers shall be selected at random from the lot. To ensure the randomness of selection, method given in IS 4905 may be followed.

### F-2 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

For non-destructive tests the containers selected at random according to **F-1.2** shall be tested for capacity, closure leakage test and hydrostatic pressure test. A container failing to satisfy any one or more of these tests requirements shall be regarded as defective. The lot shall be considered as conforming to the requirements for these characteristics, if the number of defectives in the sample does not exceed the number given in co1 (3) of Table 1.

**Table 1 Scale of Sampling and Permissible Number of Defectives**

(*Clauses* F-1.2 *and* F-2)

| Sl No. | Lot Size | For Non – Destructive Tests | |
|---|---|---|---|
| | | No. of containers to be Permissible | Number of selected Defectives (n) |
| (1) | (N) (2) | (3) | (4) |
| i) | Up to 500 | 10 | 2 |
| ii) | 501 to 1 000 | 20 | 4 |
| iii) | 1 001 and above | 30 | 6 |

## ANNEX G

(*Foreword*)

## COMMITTEE COMPOSITION

Plastics Packaging Sectional Committee, PCD 21

| *Organization* | *Representative(s)* |
|---|---|
| Indian Institute of Packaging, Mumbai | Dr Babu Rao Guduri (***Chairperson***) |
| All India Food Processors Association, (AIFPA), New Delhi | Shri Mohit Chaudhary |
| All India Plastics Manufacturers Association (AIPMA), Mumbai | Shri Kailash B. Murarka<br>Shri Kishore Sampat (*Alternate*) |
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| Chemco Plastic Industries Private Ltd, Mumbai | Shri Gaurav Saraogi<br>Shrimati Rupande Sampat (*Alternate*) |
| Chemicals & Petrochemicals Manufacturers Association, New Delhi | Shri Uday Chand<br>Dr Kanak B. Das (*Alternate*) |
| Coca-Cola India, Gurugram | Shri Virendra Landge<br>Shri Rajendra Dobriya (*Alternate*) |
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| Foundation for Innovative Packaging and Sustainability (FIPS), Mumbai | Shri M. K. Banerjee |
| Gas Authority of India Ltd, (GAIL) Noida | Shri Manish Khandelwal<br>Shri Nitin Gupta (*Alternate*) |

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| IIT Roorkee-Saharanpur Campus, Roorkee | Dr Yuvraj Singh Negi |
| Indian Centre for Plastics in the Environment (ICPE), Mumbai | Shri T. K. Bandopadhyay |
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## Amendments Issued Since Publication

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